

## PATENT SPECIFICATION



Convention Date (Sweden) : March 6, 1931.

**380,722**

Application Date (in United Kingdom) : March 4, 1932. No. 6603 / 32.

Complete Accepted : Sept. 22, 1932.

## COMPLETE SPECIFICATION.

## Improvements in Shaft Couplings.

I, CARL AUGUST RUDQVIST, of Lidingö 2, Sweden, a subject of the King of Sweden, do hereby declare the nature of this invention and in what manner the 5 same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention relates to couplings of the type comprising coupling members or flanges to be secured to the ends of the shafts to be coupled and a resilient member arranged between said coupling members or flanges and consisting, for instance, of one or more disks of 10 steel, rubber or the like, said resilient member being secured to the coupling members, alternately to the one and to the other.

Couplings of this type are adapted to 20 take angular and parallel displacements between the two shafts.

In couplings of this type it is previously known to arrange between the coupling members a body adapted to take up axial stresses in the one direction, or 25 in both directions. However, in said known couplings this body is so arranged that the possibility of parallel displacement and, to a certain degree, also angular displacement between the shafts 30 is entirely lost.

The invention has for its object to provide a coupling of the type described provided with a body adapted to take up 35 axial stresses without, however, preventing the possibility of parallel and angular displacements between the shafts. According to the invention this object is attained by forming the body arranged 40 between the coupling members and/or said coupling members in such a manner as to permit rolling or sliding between the body and the coupling members and thereby allowing radial displacement of the latter.

45 The invention will be more fully described with reference to the accompanying drawings showing by way of example two embodiments of same and in this connection other features characterizing the 50 invention will also be set forth. A first embodiment is shown in Figs. 1 and 2 in axial section and side elevation, respectively. Fig. 3 is an axial sectional view

of the second embodiment and Fig. 4 is a lateral view of the spiders used in this 55 embodiment.

According to Figs. 1 and 2, 10 and 11 60 designate two shafts and 12 and 13 coupling flanges to be secured to the ends of the shafts in any suitable manner, e.g. by key and groove. Arranged between said flanges 12, 13 is a resilient member 14 65 consisting of a plurality of disks of resilient material as for instance rubber, metal or the like. The assembled disk 14 is secured to each of the flanges at three points, alternatingly to the one and to the other flange, for instance by means of screw bolts 15 and 16, respectively, apertures being provided in the flanges to take the nuts as shown at 17. Formed centrally in the disk 14 is an opening 18, and inserted in said opening between the coupling flanges is a ball 19, of for instance hardened steel, bearing on the 70 plane side of the coupling flanges. 75

The ball 19 will take up axial pressures, so relieving the resilient disk 14, whereas axial tensile forces must still be taken up by said disk. It is to be observed that the ball 19 will in no manner prevent 80 angular and/or parallel displacements between the shafts.

In Figs. 3 and 4 an embodiment of the 85 invention is shown in which the body arranged between the coupling members is capable of taking up axial stresses in both directions so relieving the resilient member and without interfering with the 90 possibility of the shafts of parallel and angular displacements in relation to each other. In this embodiment each of the coupling flanges 12, 13 has secured thereto a spider 21 and 22, respectively, said 95 spiders consisting each of three arms secured to the corresponding flange for instance by means of the same screw bolts 15, 16 which serve to secure the disk 14. The central portion of the spiders is curved outwardly from the plane of the 100 arms and the spiders are combined with each other in such a manner that an arm of the one spider enters the space between two adjacent arms of the other spider the 105 arms of the two spiders being thus positioned at different planes perpendicular

BEST AVAILABLE COPY

to the axis of the coupling, the distance between such planes being equal to the thickness of the resilient disk 14 which, is thus embraced by the arms as by claws, alternately by an arm of the one spider and by an arm of the other spider. The curved central portions of the spiders will form a space for a ball 20 constituting the body referred to and projecting through central openings 20a in the spiders 21, 22 to bear on additional bearing plates 33 secured to the coupling members 12, 13. The openings 20a are somewhat smaller than the diameter of the ball 20 and consequently when the ball is positioned between the spiders, it cannot drop out from its place. The ball 20 will take up axial stresses in both directions, axial pressures by the aid of the bearing plates 33 and axial tensile forces by the aid of the spiders 21, 22. On account of shape and arrangement of the spiders above described the ball will in no manner prevent parallel and angular displacement between the shafts.

The clearance required for this parallel displacement is effected by the spiders 21, 22 having somewhat greater screw holes than corresponds to the diameter of the fastening bolts 15, 16 as shown in the figures at a on an exaggerated scale. This clearance may be effected in any other manner, as for instance between the ball and the spiders.

The disk 14 may be reinforced by means of flanged rings 32.

The device is assembled in the following manner:—

The spiders 21, 22 are brought into position at opposite sides of the ball 20, the disk 14 is then inserted edgewise, inner edge first, beneath two spider arms on the same spider and finally the said disk is stretched over the third spider arm on said spider, the disk being resilient or elastic so that such a mounting of the same between the spiders is possible.

The body arranged between the coupling flanges may have another shape than a ball, for instance, it may consist of any other body of rotation, or a plane plate, the corresponding bearing surfaces of the coupling members or parts belonging thereto being in such case suitably curved so as to allow rolling or sliding between the body and said members or parts. In certain cases it may be of advantage to

let the body co-operate with the actual ends of the shafts instead of with the coupling members or parts belonging thereto.

The invention is not limited to the embodiments shown and described which are only illustrative.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A coupling to be used between two shafts comprising coupling members to be secured to the ends of said shafts, a resilient member arranged between said coupling members and secured to same at a plurality of points, alternately to the one and to the other of said coupling members, and a body arranged between the coupling members and adapted to take up axial stresses, characterized by the fact that said body and/or the coupling members are so formed as to permit radial adjustment of the shafts by rolling or sliding between the body and the coupling members.

2. A coupling according to claim 1 wherein a spider is secured to each of the coupling members on the opposing surfaces thereof, said spiders having each an outwardly curved central portion and being secured to the coupling members by the securing means of the resilient member and combined with each other in such manner that the resilient member is embraced by the spider arms as by claws, alternately by an arm of the one spider and an arm of the other spider, the outwardly curved central portions of the spiders forming together a space for the body so as to permit said body to roll or slide within said space.

3. A coupling according to claim 2 wherein the spiders are provided with central openings and the coupling members with additional bearing plates, a ball constituting said body projecting through said opening and rolling or sliding on said bearing plates.

Dated this 4th day of March, 1932.

For the Applicant,  
HERBERT HADDAN & Co.,  
Chartered Patent Agents,  
31 and 32, Bedford Street, Strand,  
London, W.C.2.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1932.

BEST AVAILABLE COPY

*[This Drawing is a reproduction of the Original on a reduced scale]*

Fig. 1

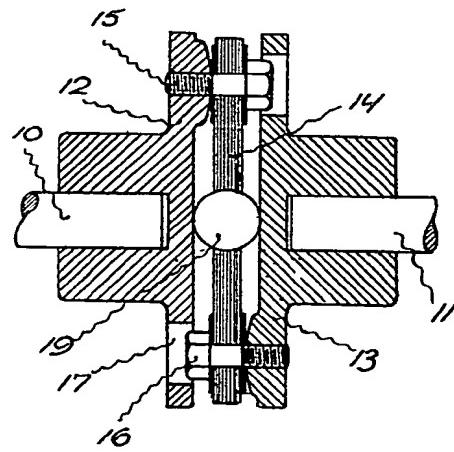


Fig. 2

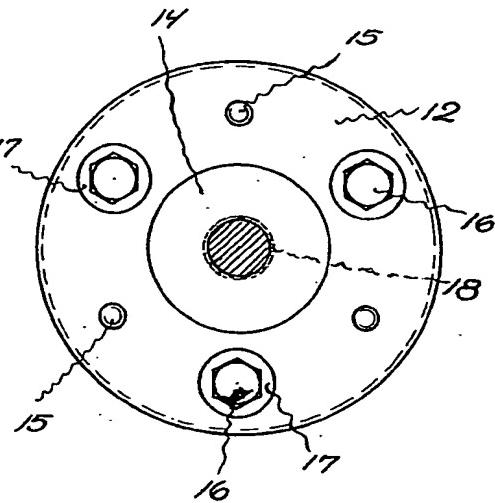


Fig. 3

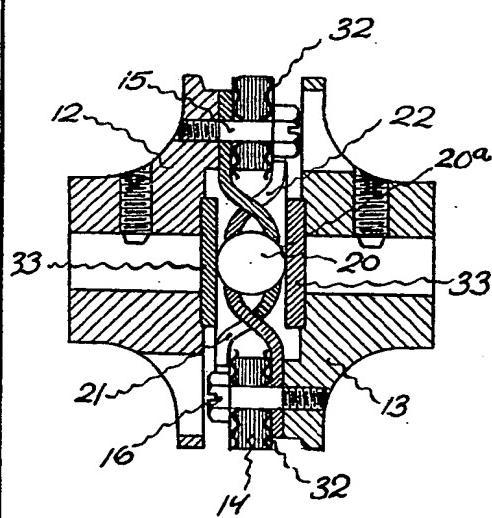
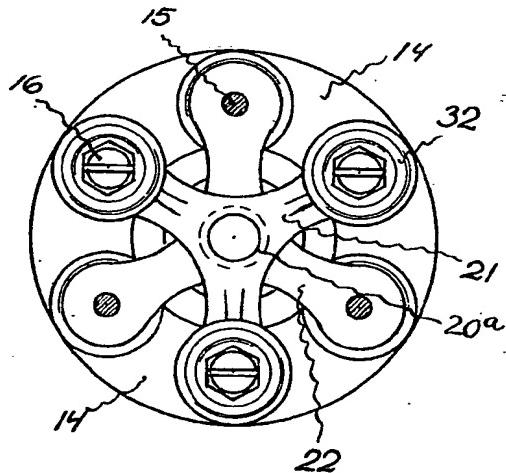


Fig. 4



Charles & Read Ltd. Photo Litho.

BEST AVAILABLE COPY

THIS PAGE BLANK (USPTO)